



Minimize Deposits into the Weed Seedbank in Mint Fields

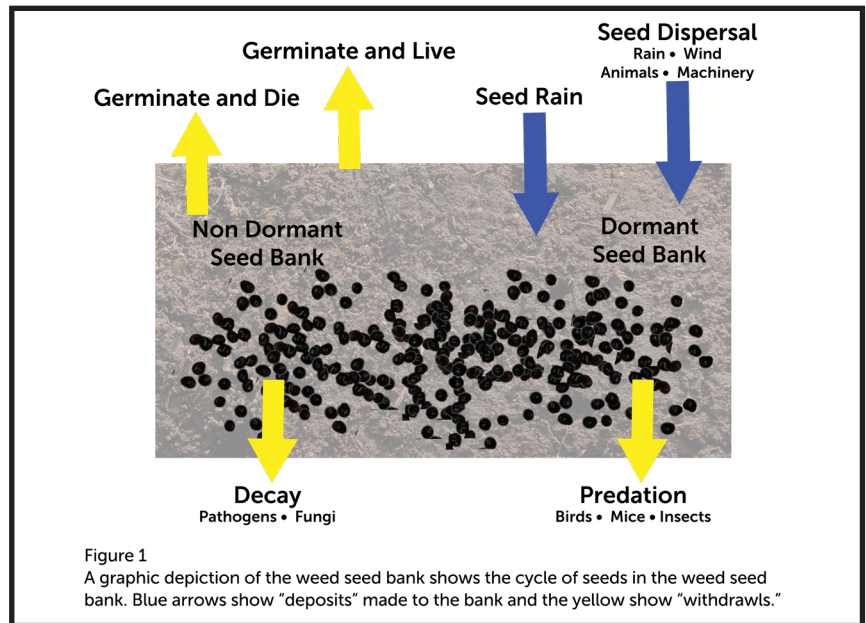
Problem weeds such as pigweeds and kochia have been plaguing mint growers in the PNW for years. These weeds can cause a multitude of problems in mint production, competing with mint for nutrients, water, and sunlight. Additionally, weed competition can reduce yield and impact value of the mint oil, and in even in extreme cases can cause the oil to be unmarketable.

Weeds such as pigweeds, contain compounds that can alter odor, color, and impact flavors of the mint. If not controlled these weeds get extracted along with the mint oil during the distillation process. As few as just three pigweed plants in ten square feet can impact the quality of the oil - deeming it unacceptable.

THE WEED SEEDBANK

These weeds (as well as others) can create additional problems due to the persistent seed bank (see Figure 1) and continual germination throughout the growing season. While it is essential to control the weeds of today, it is also extremely important to prevent weeds in the future.

Just one redroot pigweed can produce 100,000+ seeds, and these seeds can live for years in the soil. Say for example, a post emergence product provides 95% control; that would still allow 5% of plants to escape. Lets say just 50 plants per acre escape. Based on this scenario, the potential impact would be $50 \times 100,000 = 5$ million seeds per acre!



A TOOL TO CONTROL WEEDS

TOUGH® 5EC, brought to mint growers in 2017 under a Section 18, is now an EPA registered contact herbicide for all varieties of mint and provides a useful tool to help control these difficult to kill and problematic weeds and reduce the deposits made into the weed seedbank. Prior to EPA registration, TOUGH 5EC had shown improved control of these troublesome weeds and increased oil yield, at universities, and now field use corroborates those results.

(See reverse)

EPA Reg. No. 91746-5



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A Great Tool for "Tough" to Control Weeds

- **POST-EMERGENCE** solution
- **CONTACT** herbicide
- **FAST-ACTING (7-10 days)**
- **SAFE (will not cause injury to crops)**
- **NO Plant Back Restrictions**
- **EXCELLENT EFFICACY on difficult-to-control, actively growing broadleaf weeds**

WEEDS CONTROLLED



Kochia



Pigweeds



Black Nightshade



Palmer Amaranth



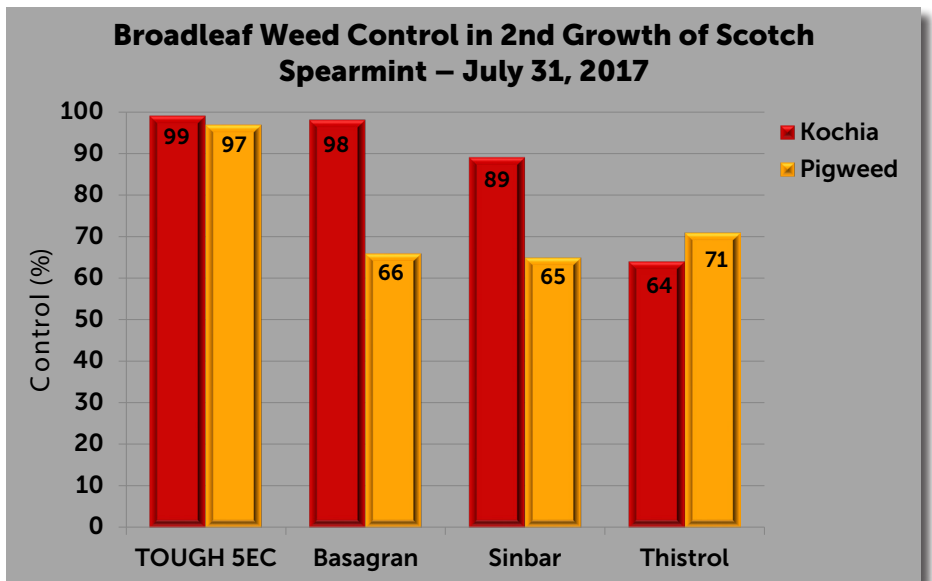
Common Waterhemp



Common Lambsquarters

In 2017, a trial was coordinated by Dr. Rick Boydston, USDA - ARS. The research was conducted to determine the comparative efficacy of pyridate (Tough®5EC) to other registered broadleaf herbicides on local broadleaf weeds in peppermint, native spearmint, or Scotch spearmint at five locations representing the major U.S. mint production regions¹.

Tough® 5EC was the top herbicide treatment at all locations and never lowered mint oil yields!



"We had been seeing 80% control at best, using alternate products, but incorporating TOUGH® 5EC brings that up to 95 - 100%. It's a truly valuable solution to a 'tough' problem."

Scott Setniker -
Setniker Farms, Independence, OR

Tough 5EC is a registered trademark of Belchim Crop Protection, Basagran is a registered trademark of AgriSolutions, Thistrol is a registered trademark of Nufarm, Sinbar is a registered trademark of NovaSource.

Photos Courtesy of Rick Boydston, USDA-ARS -Prosser, WA

¹This is not intended to be an endorsement by Dr. Rick Boydston or the USDA ARS.



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